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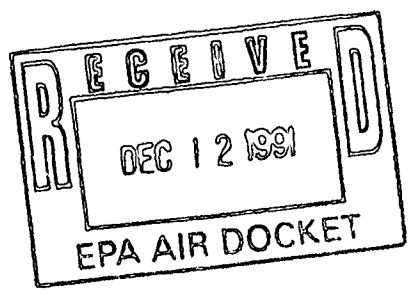

BY HAND

Ms. Mary T. Smith
Director
Field Operations and Support Division
Office of Mobile Sources
EN-397F
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

Re: **Public Docket No. A-91-46**

Dear Ms. Smith:

Ethyl Corporation ("Ethyl") has learned in recent discussions with EPA's Office of Research and Development ("ORD") that ORD generally accepts the refined manganese exposure analyses completed since 1990 and the consensus of the March 1991 MMT/Manganese health symposium that use of the HiTEC® 3000 additive ("the Additive") will not increase the public's exposure to manganese much above background levels. Nevertheless, ORD still cannot determine "definitively" whether use of the Additive "will or will not" increase public health risk.

While it is difficult for Ethyl to respond to this latest information in the absence of a more detailed written explanation of the basis for ORD's position, this letter provides several observations regarding the relevance of public health to §211(f)(4) of the Clean Air Act ("Act"), and the results of the extensive public health analyses that have taken place in this proceeding. Some final observations are also included on recent automobile company comments.

I. THE ROLE OF PUBLIC HEALTH IN FUEL ADDITIVE WAIVER PROCEEDINGS

Section 211(f)(4) of the Act does not address the public health impacts of use of a new additive. Nor, for that matter, does the legislative history of §211(f) identify public health as a relevant criterion. For these reasons, in prior waiver application decisions, the Agency has found that public health is

not a relevant criterion under § 211(f), a determination that is also reflected in the Agency's waiver application guidelines.[1/]

In order to provide a complete picture regarding the Additive, however, Ethyl provided extensive analyses on relevant environmental and public health issues. Significantly, this type of analysis has not been required of, and has not been provided by, any other applicant for a fuel additive waiver.

Ethyl is therefore perplexed by ORD's lengthy evaluation of this Additive in the context of this waiver proceeding. For the reasons discussed below, the record in this proceeding regarding public health does not provide a basis for denying Ethyl's waiver application.

A. To the Extent Public Health is Relevant to this Proceeding, the Act Does Not Impose a "Zero Risk" Standard.

Because the overall goal of the Act is "to protect and enhance the quality of the Nation's air" in a way that "promote[s] the public health and welfare and the productive capacity of its population,"[2/] Ethyl provided the Agency with information regarding the health implications of use of the Additive. Despite this and other information, however, ORD has been reluctant to draw any "definitive" conclusions about the Additive. If ORD's position means that a waiver application cannot be approved without "definitive" proof of the absence of risk, this would amount to the impermissible application of a "zero risk" standard to §211(f) waiver applications.

That Ethyl has gone beyond the strict requirements of § 211(f)(4) and provided information on public health does not mean that it is obligated to prove the negative -- i.e, to prove definitively that use of the Additive will not increase public

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1/ For a detailed discussion of public health and § 211(f)(4), see Comments in Support of the Waiver Application for the HiTEC® 3000 Performance Additive (July 23, 1990)(hereafter "1990 Ethyl Comments"), Docket A-90-16, IV-D-58, at 3-12. Of particular note in this regard, the Agency has determined that "[t]he waiver provision, section 211(f)(4), is solely concerned with the emission standards which apply to tailpipe emissions of HC, CO, and NOx and evaporative HC emissions." For this reason, the emission of "unregulated pollutants" having a "potential adverse effect on health" are not relevant to decisions under § 211(f)(4). See In Re Application for MTBE, Decision of the Administrator (December 26, 1978) at 4, n. 5.

2/ CAA §101(b).

health risk. Where the Agency has relied, as it must in this case, on the general purposes of the Act to evaluate the overall impacts of a proposed decision, it has observed that a "balancing of the social and economic considerations with the environmental implications [of a decision is necessary] . . . to fulfill the mandate of the Clean Air Act."[3/] This balancing approach clearly does not contemplate a zero risk standard. Indeed, as Ethyl has discussed elsewhere, any reasonable balancing of the overall goals of the Act would support approval of this application.[4/]

From a broader perspective, definitive proof of "no increase" in health risk has never been the standard for evaluating health risks even under statutory provisions that are explicitly based on consideration of public health. Thus, for example,

- The Agency has interpreted the term "endanger" as used in § 211(c) of the Act, a provision authorizing the Agency to regulate fuels and fuel additives on public health grounds, to mean "a significant risk of harm."[5/]

- In interpreting § 112, a provision of the Act that authorizes the Agency to regulate emissions of hazardous air pollutants, the Agency has clearly rejected the view that it requires the Agency to establish emission standards that eliminate all risks to public health.[6/]

- Other statutes that address health risk, including the Toxic Substances Control Act ("TSCA"), do not provide for "zero risk" regulation. In enacting TSCA, for example, Congress sought to ensure adequate regulation of "chemical substances and mixtures which present an unreasonable risk of injury to health or the environment."[7/] Indeed, the U.S. Court of Appeals for the Fifth Circuit expressly rejected a recent

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3/ 39 Fed. Reg. 31000, col. 1 (1974) (emphasis added).

4/ See infra at 5-6.

5/ See 38 Fed. Reg. 33734 (December 6, 1973); Ethyl Corp. v. Environmental Protection Agency, 541 F.2d 1, 13 (D.C. Cir. 1976).

6/ See Natural Resources Defense Council v. U.S. Environmental Protection Agency, 824 F.2d 1146, 1164-65 (D.C. Cir. 1987)("the Administrator's decision must be based upon an expert judgment with regard to the level of emission that will result in an 'acceptable' risk to health") (emphasis added).

7/ 15 U.S.C. § 2601(b)(emphasis added).

attempt by the Agency to impose a "zero risk" standard under TSCA.[8/]

Against this background, it would be patently unreasonable to impose a zero risk standard under a provision such as § 211(f)(4) that does not even mention public health.

B. The Agency Bears the Burden With Respect to Public Health in Any Decision on Ethyl's Waiver Application.

The applicant under § 211(f)(4) has the burden of establishing that use of a fuel additive will not "cause or contribute" to a failure of emission control devices to meet applicable emission standards.[9/] Nothing in the statute or the legislative history, however, extends this burden to other secondary issues, such as public health.

To the contrary, the Agency has the burden of conducting the balancing contemplated by §101(b) of the Act (to the extent consideration of public health is even relevant to a decision on a waiver application), as well as justifying a decision to deny a waiver application on public health grounds as a result of that balancing.[10/] This burden is especially great in this case, since the Agency previously concluded in 1985, after a thorough review of all available health and exposure information on manganese, that concentrations of manganese at levels far higher than those at issue in this proceeding present no public health concern.[11/]

8/ See Corrosion Proof Fitting v. EPA, No. 89-4596 (5th Cir., decided October 18, 1991)("Congress did not enact TSCA as a zero-risk statute.").

9/ See Reply Comments of Ethyl Corporation in Support of the Waiver Application for the HiTEC 3000 Performance Additive (November 26, 1991) (hereafter "Ethyl Reply Comments") at 38-57.

10/ See 1990 Ethyl Comments at 9-12.

11/ See 50 Fed. Reg. 32627 (1985). At that time, the Agency determined that "[t]he target protective levels for neurotoxic effects were those recommended by the World Health Organization (WHO) and the American Conference of Governmental Industrial Hygienists (ACGIH)." Id. at 32628, col. 1. The Agency concluded that these levels were "reasonable and conservative" based on the existing data for manganese. Id. at col. 2 (emphasis added). The level currently deemed protective of public health (including sensitive subpopulations) by the WHO is 1.0 ug/m^3, a level two and one-half times higher than that suggested in ORD's preliminary health risk analysis. See infra note 15.

The Agency cannot meet this burden regarding public health on the basis of mere conjecture or speculation -- i.e., that, as the ORD staff has apparently determined in this case, the Additive "may or may not cause a risk."[12/] As the courts of appeals have repeatedly observed, the Agency must have "a more-than-theoretical basis for suspecting that some amount of exposure occurs and that the substance is sufficiently toxic at that exposure level to present an 'unreasonable risk of injury to health.'"[13/]

On the record before the Agency in this proceeding, no such determination can be made. Since November of 1990, Ethyl and others have completed additional analyses that ORD now agrees provide a better estimate of maximum exposures to manganese with use of the Additive. These new estimates reduce the maximum manganese exposures generated by ORD in its November 1990 analysis by more than a factor of four and are well-below the health-based "Reference Concentration" ("RfC") for manganese established by ORD. The estimates are also, as the EPA-sponsored symposium on manganese concluded, not much different from background concentrations to which people are exposed every day.[14/] Ethyl believes that these data clearly establish that use of the Additive will not adversely affect public health.[15/]

12/ Chemical Manufacturers Ass'n v. U.S. Environmental Protection Agency, 859 F.2d 977, 986 (D.C. Cir. 1988)(emphasis added); see also Corrosion Proof Fitting v. EPA, No. 89-4596 (5th Cir., decided October 18, 1991), n. 14.

13/ Chemical Manufacturers Ass'n, 859 F.2d at 988 (emphasis added); see also Corrosion Proof Fitting, No. 89-4596 (5th Cir., decided October 18, 1991), n. 14.

14/ In Re Application for a Fuel Additive Waiver Filed by Ethyl Corporation Under § 211(f)(4) of the Clean Air Act (July 12, 1991) (hereafter "1991 Waiver Application") at 44-53. The fact that manganese emitted from the tailpipe is in the form of Mn_3O_4 does not alter this conclusion because, as Dr. Daniel Roth concluded after an extensive review of the health literature on manganese, "[t]here is no reliable evidence that Mn_3O_4 is more toxic than other forms of manganese." Supplemental Reply of Ethyl Corporation to Late-Filed Comments on Public Health Effects of HiTEC® 3000 (August 23, 1990), Docket A-90-16, IV-D-139, Attachment 1 at 13.

15/ Based on analyses conducted by Ethyl and others, the range of maximum manganese exposure levels (i.e., exposure levels for highly exposed individuals such as taxi drivers) with use of the Additive would be 0.049 to 0.2 ug/m^3, depending upon whether the

(continued...)

Nevertheless, even if one accepts ORD's position that it cannot determine "definitively" whether use of the Additive "will or will not" increase public health risk, this does not provide any basis for the Agency to deny the waiver application on public health grounds. That is, ORD's statement provides the Agency no basis to conclude that use of the Additive will increase public health risk.[16/] Under these circumstances, and given the significant public health benefits associated with use of the Additive,[17/] a speculative risk to public health does not provide a basis for denying this waiver application.

C. Future Health Testing

Due to ORD's uncertainty, Ethyl is committed to working with EPA on continued testing and analysis of the Additive to ensure that its use remains compatible with protection of the public

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15/ (...continued)
maximum exposure is based on measured personal exposures to manganese (0.049 ug/m^3) or the application of very conservative exposure models (0.1-0.2 ug/m^3). See 1991 Waiver Application at 44-53. The RfC for manganese established by ORD is 0.4 ug/m^3, and in all likelihood should be three times higher (or about 1.2 ug/m^3), which would put the RfC in the range deemed protective of public health by other independent health organizations such as the Agency for Toxic Substances and Disease Registry (2.0 ug/m^3) and the World Health Organization (1 ug/m^3). Id. at 54-58. Even accepting ORD's conservative RfC, however, maximum manganese exposure levels would remain well-below the level deemed protective of public health.

16/ If anything, ORD's analysis makes clear that it is more likely that use of the Additive will not increase public health risk since all estimated maximum modeled and measured exposure data are well-below the manganese RfC. See supra note 15.

17/ As discussed elsewhere, use of the Additive would result in substantial overall reductions of automotive pollutants, including nitrogen oxide, carbon monoxide, and toxic emissions. Use of the Additive would also reduce refinery emissions, and result in a substantial savings in crude oil consumption (up to 85,000 barrels per day). 1991 Waiver Application at 36-37. Indeed, a study conducted by Clement International suggests that use of the Additive would result in a net health benefit, since it would be used in place of toxic substances such as benzene. See id. at 63-68.

health.[18] Under statutes that make consideration of public health directly relevant to regulatory decisions, the Agency's response to uncertainty (i.e., where there is no definitive evidence that a substance will or will not present an unreasonable risk) has been to allow use of the substance, while additional testing proceeds.[19] A more restrictive approach could not be justified in this case under a provision that does not even make public health directly relevant to the regulatory decision.

In sum, analyses based on all available information on manganese and public health indicate that use of the Additive will not adversely affect the public health. The identification by ORD of limited uncertainties about manganese does not change this fundamental conclusion and provides, at most, a rationale for continuation of studies after approval of the waiver application. It does not provide the Agency with a basis for denial of Ethyl's waiver application.

II. THE RECENT SUBMISSIONS BY FORD MOTOR COMPANY AND TOYOTA

In previous submissions, Ethyl has responded at length to materials submitted by Ford and Toyota.[20] Among other things, Ethyl has shown that the Ford data are entitled to little weight in this proceeding and that, even if afforded some weight, they do not affect the conclusion that use of the Additive will not cause or contribute to the failure of emission control devices to

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[18] It bears reemphasis that ORD's RfC was derived by reducing the "lowest observed effects level" for manganese by a factor of 900. ORD's RfC for manganese thus already accounts for a substantial amount of uncertainty.

[19] For example, with respect to certain fuel constituents for which waiver applications have been granted under § 211(f)(4), such as MTBE and other oxygenates, the Agency has identified potentially adverse public health effects. See 53 Fed. Reg. 10391, 10393 (March 31, 1988) ("additional testing is necessary to determine whether the distribution and use of MTBE presents an unreasonable risk of injury to health"). Pending completion of additional health-based testing, the Agency has not banned use of these products, and indeed, has actively promoted more widespread use of these fuel constituents. See, e.g., 56 Fed. Reg. 31176 (July 9, 1991).

[20] See generally Ethyl Corporation's Comments in Support of the HiTEC® 3000 Waiver Application (October 4, 1991); Ethyl Reply Comments.

meet applicable emission standards.[21] Similarly, the Toyota data have little meaning because Toyota only tested a single vehicle using a test protocol having absolutely no relationship to EPA's Federal Test Procedure ("FTP").

In recent submissions, Ford (December 3, 1991) and Toyota (November 27, 1991) renew prior allegations, but present little new information. For the following reasons, these recent submissions provide, if anything, further support for Ethyl's waiver application.

A. Ford's Fuel Injector Analysis

On the basis of emission tests conducted on a pair of test vehicles after replacing fuel injectors, Ford asserts that use of the Additive "fouls" fuel injectors. The Ford fuel injector analysis, however, shows only that the injectors in vehicle 306 were not operating properly -- not that the Additive caused the malfunction. By contrast, to determine whether use of the Additive adversely affected fuel injector performance after 50,000 miles of vehicle operation, Ethyl measured emissions from a wide range of vehicles in Ethyl's 48-car test fleet both immediately before and after replacing fuel injectors. A statistical analysis of these emissions measurements showed that there was no statistically significant difference in emissions for the test fleet resulting from the replacement of the fuel injectors.[22] This means that the fuel injectors exposed to the Additive were not adversely affected by such exposure.

In addition, Ford suggests that replacement of fuel injectors in several vehicle models in Ethyl's 48-car test fleet after 50,000 miles may have "masked" adverse effects which would otherwise be seen in the fuel injectors at higher mileages. In this regard, the fuel injectors in Ethyl's six 2.5 liter Buicks were not replaced. These vehicles have accumulated over 95,000 miles of vehicle operation without exhibiting fuel injector malfunctions, or any significant increases in hydrocarbon or other emissions.[23]

21/ Ethyl Reply Comments at 55-56.

22/ In Re Application for a Fuel Additive Waiver Filed By Ethyl Corporation Under § 211(f)(4) of the Clean Air Act (May 9, 1990) (hereafter "1990 Waiver Application"), Appendix 2A ("Statistical Analysis of Automotive Exhaust Emissions in Support of Ethyl's HiTEC 3000 Fuel Waiver Application"), Attachment G.

23/ See Attachment 1. In addition, the six Chevy Cavaliers (model C) operated for 75,000 miles on the original fuel

(continued...)

Rather than contradicting the results of Ethyl's extensive test program, the Ford fuel injector analysis tends to confirm that use of the Additive does not adversely affect catalyst operation. For example, the Ford fuel injector analysis shows that HC emissions in Additive-fueled vehicle 306 at 105,000 miles (0.28 gram per mile ("gpm")) were actually lower than emissions from clear fuel vehicle 307 at the same interval (0.383 gpm) once the fuel injectors were replaced. This means that the Additive did not adversely affect catalyst performance in vehicle 306.[24/]

B. The Ford Driving Cycle

Ford continues to assert that the driving cycle it used in its limited test program is "representative of actual driving," on the grounds that approximately 50 percent of vehicle operation occurs on expressways and in non-urban areas. While the average speed of the Ford driving cycle (54.8 miles per hour) may be representative of some portion of vehicle operation, this does not mean that it is "representative" of national fleet operation.

For example, even accepting Ford's claim that vehicles operate at an average speed of 54.8 miles per hour ("mph") 50 percent of the time, the overall average speed would drop by over

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23/ (...continued)
injectors without exhibiting fuel injector malfunctions or increased hydrocarbon emissions. The same can be said with respect to four Chevrolet Corsicas operated for 100,000 miles. See 1990 Waiver Application, Appendix 3 ("Durability Testing, Materials Compatibility Testing, Evaporative Emissions, Driveability, and Particulate Emissions"), at 6-7.

24/ See Letter to Air Docket from David L. Kulp dated December 3, 1991 ("Exchange Fuel Injectors"). Compare Letter to Mary T. Smith from David L. Kulp dated September 23, 1991, Docket No. IV-D-10. In an attempt to bolster its concern about fuel injectors, Ford also conducted an analysis of Ethyl's test data in which Ford dropped all emissions data after the replacement of fuel injectors in Ethyl's test vehicles. It is not proper to drop these emissions data because, as noted above, a statistical analysis of emissions immediately before and after fuel injector replacement showed that replacement of the fuel injector had no statistically significant effect on emissions from the 48-car test fleet. See supra note 22. Nevertheless, even accepting Ford's premise that these data should be dropped, Ford's analysis shows a difference in HC emissions little different from that reported by Ethyl (0.027 versus about 0.02 gpm). This result further confirms that Ford's concern about fuel injectors is unfounded.

25 percent (to 41 mph) if one assumes that vehicles operate at the average speed reflected in EPA's FTP (i.e., 28 mph) the other 50 percent of the time. If one assumes that vehicles operate at the average speed reflected in EPA's New York City driving cycle (14 mph) when they are not operating in a highway mode, the overall average speed (34 mph) would approximate the average speed reflected in EPA's FTP.

Moreover, Ford reportedly operated its test vehicles 24 hours a day, seven days a week at an average speed of 54.8 mph.[25/] No one operates vehicles in this fashion (i.e., no cool down periods and almost 1300 miles per day or approximately 10,000 miles per week of mileage accumulation). Finally, the Ford driving cycle differs substantially from the driving cycle used to certify vehicles under the Act. The Ford driving cycle therefore cannot be construed as "representative" for purposes of this waiver application.[26/]

C. Statistical Analysis of the Ethyl Test Data

Ford asserts that the statistical analysis of the data from Ethyl's 48-car test fleet did not take into account the model-to-model variability reflected in that emissions data. This assertion is simply incorrect. As reflected in the statistical analysis conducted by Systems Applications International ("SAI"), the variability in emissions from model-to-model was accounted for in the analysis.[27/] Indeed, SAI developed tests designed specifically to account better for the model-to-model variability reflected in the test data.[28/]

25/ See Letter to Mary T. Smith from Jeffrey G. Smith dated December 11, 1991. A copy of this letter is Attachment 2.

26/ Ford relies on 40 C.F.R. § 86.085-24 to support its assertion that the Ford driving cycle is "representative." Ford's reliance on this regulation is misplaced because the regulation applies only to emission testing of vehicles "equipped with an item (whether that item is standard equipment or an option) that can reasonably be expected to influence emissions." Id. at 86.085-24(g)(3)(i)(emphasis added). The regulation has nothing to do with the representativeness of driving cycles used in emission testing.

27/ See 1990 Waiver Application, Appendix 2A ("Statistical Analysis of Automotive Exhaust Emissions in Support of Ethyl's HiTEC 3000 Fuel Waiver Application") at 45-46, C-15, D-19, E-13.

28/ Id. at C-15.

D. Toyota's Emission Data

Toyota presents emission data on a single vehicle operated on fuel with and without the Additive. The vehicle accumulated an initial 30,000 miles on fuel containing the Additive. At that point, the catalyst and oxygen sensor were replaced and an additional 30,000 miles was accumulated on clear fuel. In its submission, Toyota compares the 0-30,000 mile emission data with the 30-60,000 data for this single test vehicle. The Toyota data have little meaning for several reasons. For example, Toyota did not use the FTP to generate emission data. Moreover, Toyota provides no information upon which to conclude (i) that one can validly compare emissions generated from 0-30,000 miles to emissions generated from 30-60,000 miles in a single test vehicle, or (ii) that differences in emissions are attributable to the Additive instead of other confounding factors such as normal component-to-component variability in catalyst performance. Finally, the Toyota data, even if accepted at face value, do not show that use of the Additive causes exceedances of emission standards.

In sum, Ethyl has established a thorough case in support of the Additive, and critical commentators have offered only partial and inconsistent results in response to this case. Significantly, none of these results show that the Additive will cause or contribute to exceedances of emission standards. When all of the evidence in the record is viewed either qualitatively or quantitatively, therefore, Ethyl has clearly carried its burden of proof.[29/]

III. CONCLUSION

As originally filed with the Agency in May 1990, Ethyl's waiver application provided the results of the most extensive emissions test program ever undertaken by a private company in support of a waiver application. For the sake of completeness, Ethyl also evaluated a range of secondary considerations, including public health, that are not addressed by § 211(f)(4), and have not been addressed by other waiver applicants.

Ethyl withdrew its initial waiver application in November 1990, in a spirit of cooperation with the Agency, in order to address more fully two questions raised by EPA: (1) the implications of emissions testing conducted by the EPA Ann Arbor laboratory, and (2) a public health analysis performed by ORD. After extensive additional testing, the Ann Arbor emissions data were discovered to have been the result of fuel contamination in the Ann Arbor lab. With respect to the ORD health analysis, a four-day EPA-sponsored health symposium resulted in a consensus

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29/ See Ethyl Reply Comments at 55-56.

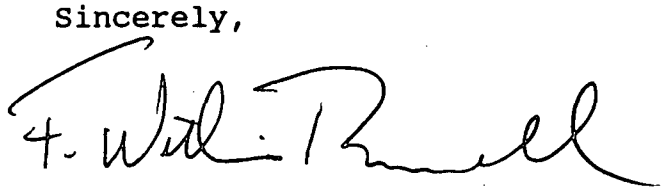
that use of the Additive would not materially alter background exposures to manganese.

The efforts put forward by Ethyl in addressing these issues demonstrated a continued commitment to evaluate and to resolve all issues raised by the Agency, regardless of their relevance to § 211(f)(4) waiver applications, and even though the weight of the evidence clearly supported Ethyl's application. As a result of these efforts, the record in this proceeding shows beyond a doubt that Ethyl has been subjected to, and has met, a standard greater than has been applied to any other waiver applicant.

Having addressed the two issues raised by EPA in November 1990, Ethyl refiled its application earlier this year. At the end of this new waiver proceeding, Ethyl is now confronted by two issues similar to those presented in late 1990: (1) limited, anomalous emissions data from Ford Motor Company; and (2) a new statement from ORD that, in spite of exposure estimates that are below ORD's RfC and in spite of the results of the EPA-sponsored health symposium, ORD still cannot reach a definitive conclusion regarding public health risk. In recent filings, Ethyl has not only exhaustively addressed these issues, but has offered to continue testing and health analyses in coordination with EPA after approval of the waiver application.

The time has come for a decision on this waiver application. In making its decision, the Agency should take into account the standard that it has applied to other waiver applicants, and the increased burden it has applied in this proceeding to Ethyl, in order to avoid arbitrary and capricious action. We believe that a fair evaluation of the record in this case shows that Ethyl has fully satisfied the criteria for approval of waiver applications, and that this waiver application must be approved.

Sincerely,

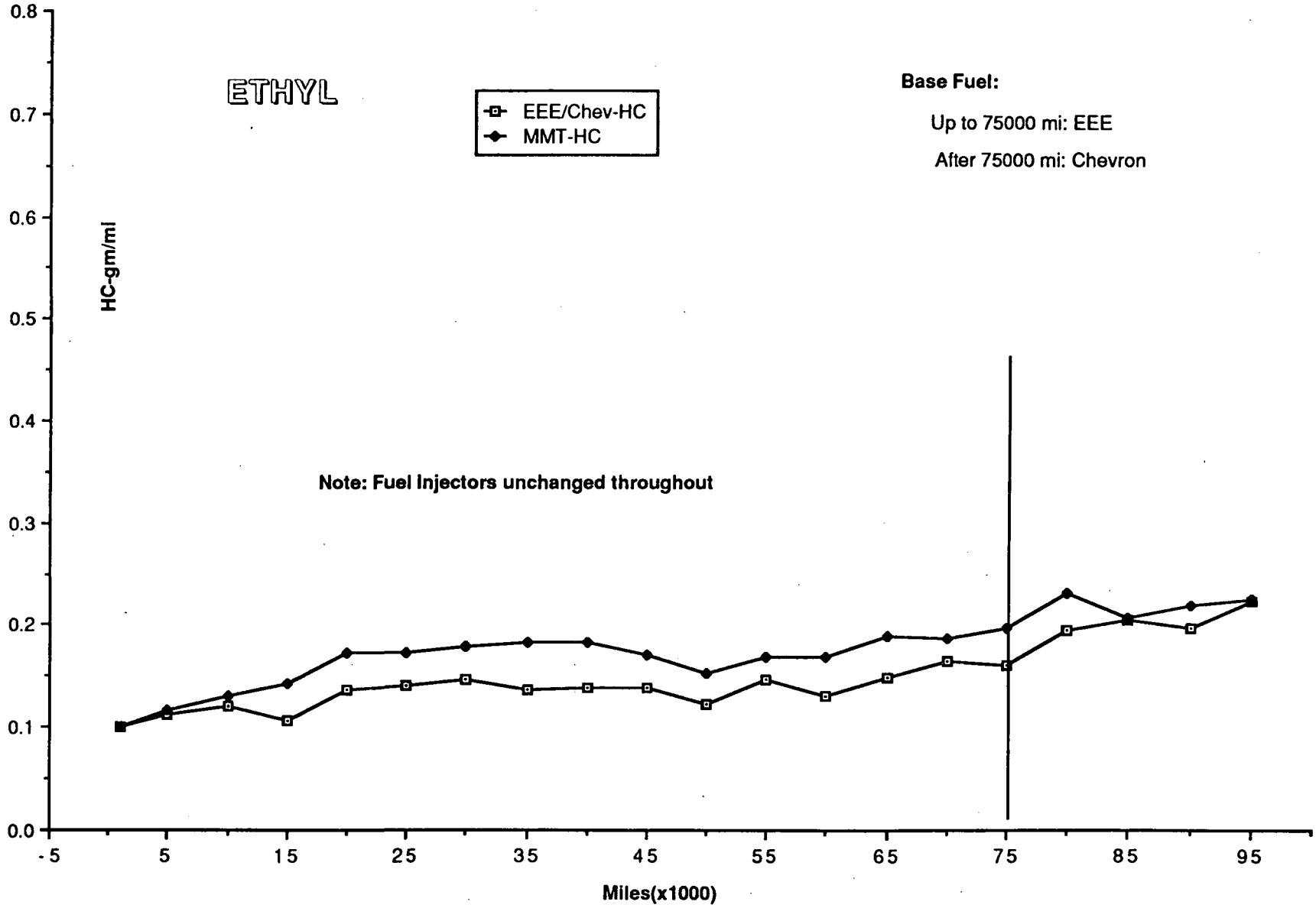


John J. Adams
F. William Brownell
Kevin L. Fast

Enclosure

cc: Public Docket No. A-91-46
Richard D. Wilson (by Mess. w/attach)
Stan Stocker-Edwards, Esq. (by Mess. w/attach)

HC Emissions(Avg)-Model G(Buick 2.5L)



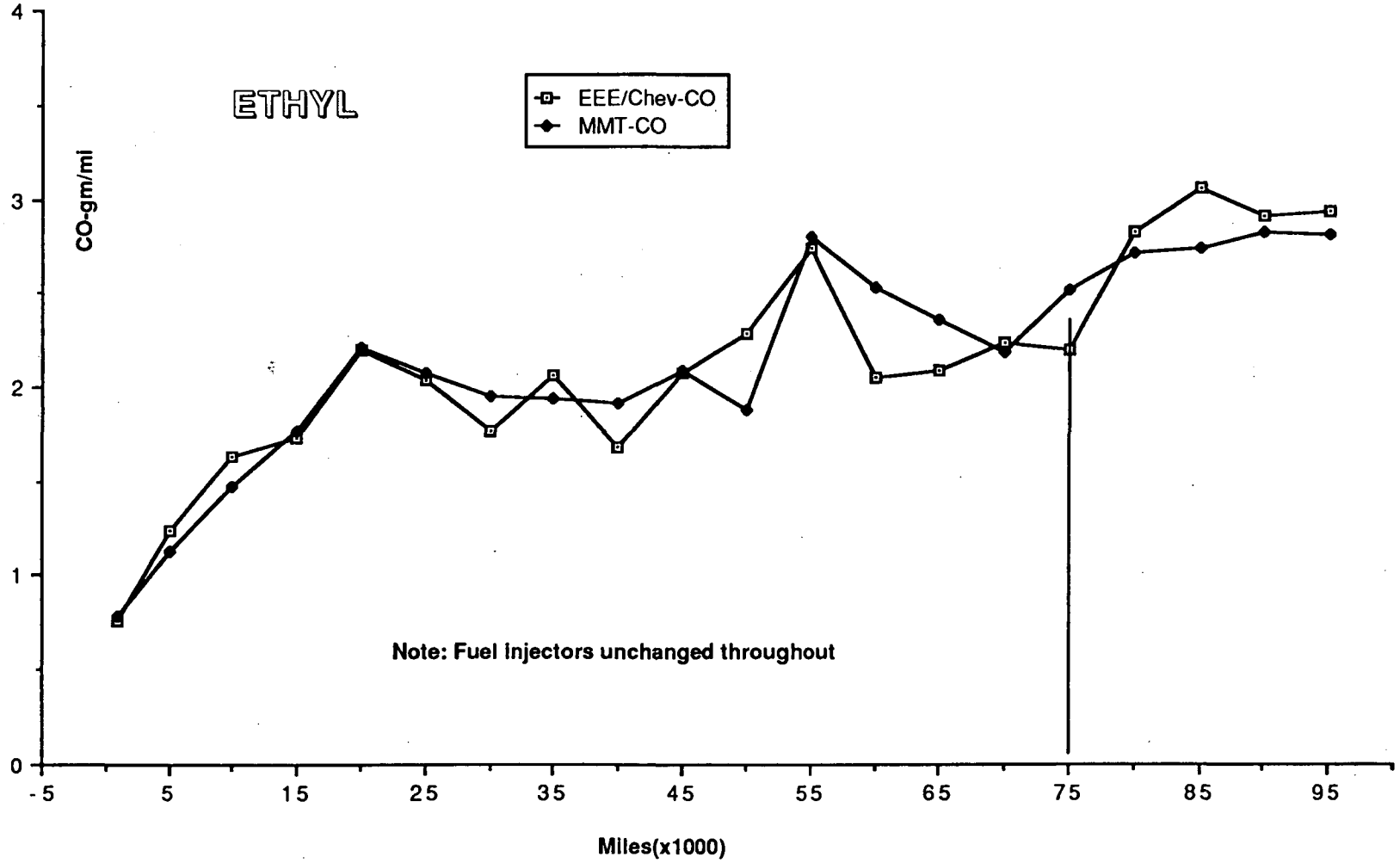
ATTACHMENT 1

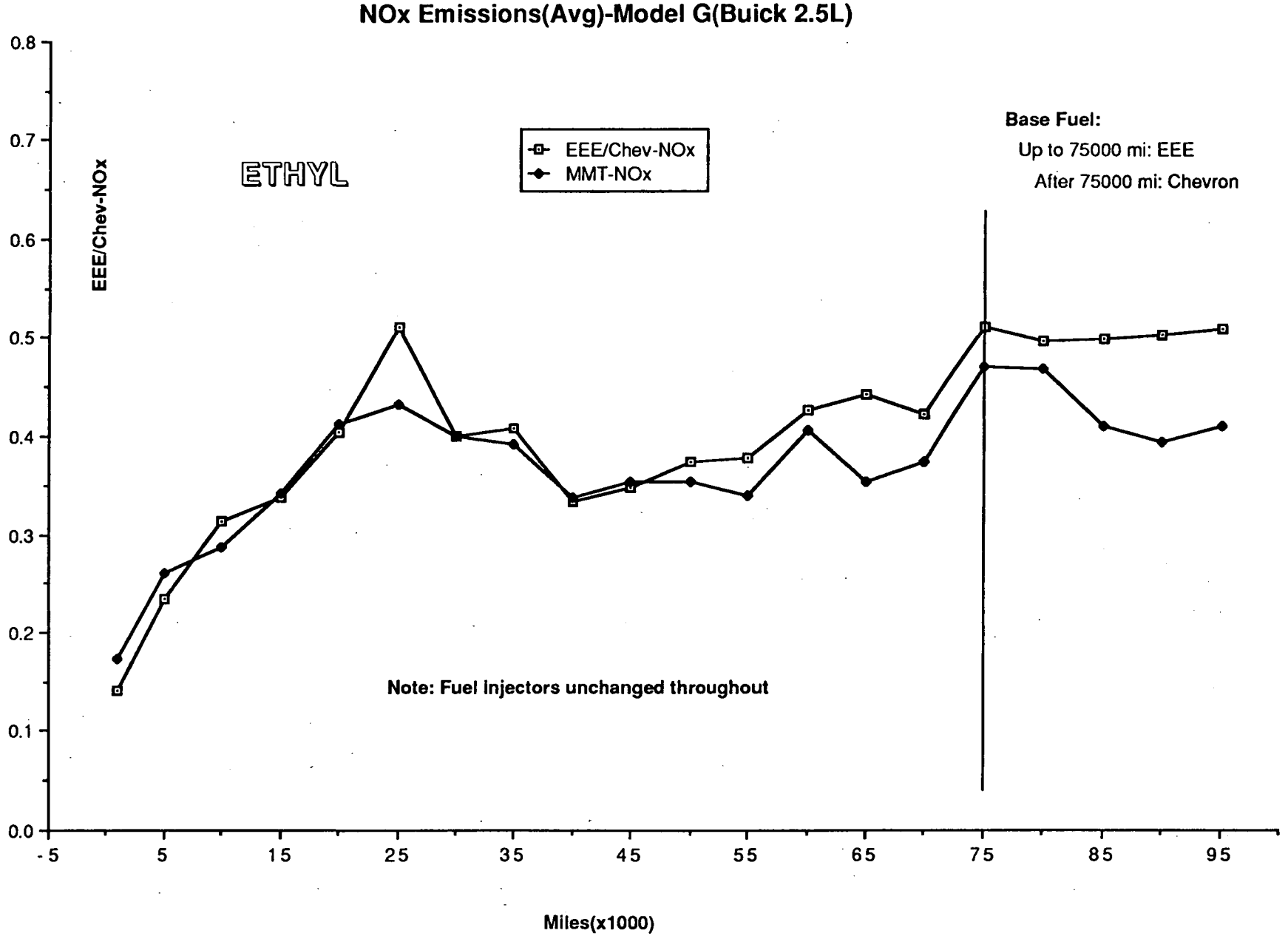
CO Emissions(Avg)-Model G(Buick 2.5L)

Base Fuel:

Up to 75000 mi: EEE

After 75000 mi: Chevron




NOx Emissions(Avg)-Model G(Buick 2.5L)
ETHYL
EEE/Chev-NOx
MMT-NOx
Base Fuel:
Up to 75000 mi: EEE
After 75000 mi: Chevron
Note: Fuel injectors unchanged throughout
EEE/Chev-NOx
Miles(x1000)
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
-5
5
15
25
35
45
55
65
75
85
95

	Miles(x1000)	EEE/Chev-HC	MMT-HC	EEE/Chev-CO	MMT-CO	EEE/Chev-NOx	MMT-NOx	Remarks
1	1	0.101	0.100	0.758	0.789	0.142	0.173	Base Fuel:
2	5	0.113	0.117	1.243	1.131	0.234	0.261	Up to 75000
3	10	0.120	0.130	1.631	1.469	0.313	0.287	miles: EEE.
4	15	0.106	0.142	1.732	1.773	0.338	0.341	After: Chevron
5	20	0.136	0.172	2.191	2.207	0.405	0.412	commercial
6	25	0.140	0.173	2.033	2.077	0.511	0.432	----------
7	30	0.146	0.179	1.770	1.947	0.400	0.399	Total of six
8	35	0.136	0.182	2.058	1.939	0.408	0.391	cars used.
9	40	0.139	0.182	1.682	1.919	0.334	0.338	Three on base
10	45	0.138	0.171	2.075	2.091	0.347	0.353	fuel;three on
11	50	0.123	0.153	2.282	1.873	0.373	0.354	base blended
12	55	0.146	0.169	2.737	2.794	0.377	0.339	with MMT
13	60	0.130	0.169	2.053	2.525	0.427	0.406	(HiTEC 3000).
14	65	0.148	0.189	2.084	2.356	0.443	0.353	Averages are
15	70	0.164	0.186	2.234	2.190	0.422	0.373	shown here.
16	75	0.161	0.197	2.198	2.511	0.512	0.471	
17	80	0.194	0.232	2.818	2.706	0.497	0.469	
18	85	0.206	0.207	3.054	2.732	0.499	0.411	
19	90	0.197	0.219	2.907	2.825	0.503	0.394	
20	95	0.224	0.226	2.936	2.813	0.509	0.411	

ATTACHMENT 2

ETHYL CORPORATION
GOVERNMENT RELATIONS
1155 Fifteenth Street, N.W., Suite 611
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Lt. Gen. Jeffrey G. Smith, U.S.A. (Ret.)
Director of Government Relations

11 December 1991

Ms. Mary T. Smith
Director
Field Operations and Support Division
Office of Mobile Sources
EN-397F
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

Re: **Public Docket No. A-91-46**

Dear Ms. Smith:

As you know, Ethyl Corporation ("Ethyl") has attempted to obtain additional information from Ford Motor Company ("Ford") concerning the specifics of the driving cycle employed in Ford's limited test program. To date, we have yet to receive complete, definitive written information.

In order to clarify the record with respect to the Ford driving cycle, Ethyl submits the following:

- David Kortum of EPA's Office of Mobile Sources reported during a telephone conversation with me on November 19, 1991 that Ford used three driver shifts per day when accumulating mileage on the Ford test vehicles. Assuming a shift is approximately eight hours, this suggests that Ford operated its test vehicles 24 hours per day.

- A representative of Ford's Washington Office reported to a staff member in my office on December 3, 1991 that Ford's test vehicles were operated 24 hours a day for mileage accumulation.

As you know, Ethyl does not believe that vehicles operated at an average speed of about 54 miles per hour, 24 hours per day, seven days a week are representative of typical driving.

Sincerely,

Jeffrey G. Smith